

REMARKS/ARGUMENTS

Claims 1-2, 4-9, 13, 15-18 and 19-24 are active.

Claim 24 is supported in the application at page 5, last paragraph.

No new matter is added.

Applicants thank Examiners Sample and Nordmeyer for the courtesy of discussing this case with their undersigned representative on March 3, 2010. During this meeting, it was explained that the cited Joret only discloses a mixture of two distinct oxides in a single layer rather than a mixed oxide of Zn and Sn as recited in the claims. Further details of this discussion are provided and expanded upon in the remarks below.

The claims here are to a transparent (e.g., glass) substrate with an antireflection laminate including 4 layers with the first and third layers having refractive indices of 1.8 to 2.2 and the second and fourth having an Ri of 1.35 and 1.65. Each layer is also defined by a particular geometrical thickness and as noted above, each layer is defined by specific oxides that are comprised in those layers.

The main focus of this application relates to antireflection coatings for windows in buildings, display cabinets, etc.

The Examiner has maintained the rejection based on Joret (FR 2,800,998 or US. 6,924,037). In response to the last Official Action Applicants explained that a doped mixed oxide of Sn and Zn in the first and third layers is different from a mixture of two or more oxides in Joret and also the light reflection lowering by a minimum of 3 or 4 % at a normal angel of incidence is different from the view standpoint discussed in Joret.

In maintaining the rejection, the Examiner picks different portions of the Joret disclosure to allege that Joret describes exactly that which is claimed. In responding to Applicants argument to the mixed oxide, the Examiner maintains that without evidence that a "mixed oxide" is known to mean unique, single phase oxide, he shall interpret the claims to include a mixture of two or more oxides (mixture) as taught in Joret.

While Applicants understand that, during the prosecution of an application in the Office, claims are to be given their broadest reasonable interpretation consistent with the teaching in the specification (*In re Bond*, 710 F.2d 831, 833 (Fed. Cir. 1990)), it is error to disregard express limitations in the claims. The Examiner may not set up a "strawman" claim and reject it rather than subject matter encompassed by the actual claims.

The plain language of Applicants' claims requires "a doped mixed oxide of Sn and Zn." The specification consistently defines a mixed tin-zinc oxide as  $\text{Sn}_x\text{Zn}_y\text{O}_z$  (see page 5 of the application and new claim 24). Applicants submit that the Examiner erred in broadly interpreting the scope and content of the subject matter claimed in a manner inconsistent with the plain language of the claims and the teaching of the Specification.

Joret does not disclose or even suggest a mixed Sn and Zn oxide in the first and third refractive index layers. In fact, the entirety of Joret's disclosure makes it clear that there is a distinction between a mixed oxide and a mixture of two oxides.

Joret does describe a mixed oxide (different from a mixture of two oxides) in the **second** and **fourth** low refractive index layers (not the first or the third as claimed). That second and fourth layers can include a **mixed silicon aluminium oxide** (see column 5 lines 7-12). Joret thus provides gives a clear definition of a "mixed oxide" as a single oxide phase containing both silicon and aluminum that is different from a mixture of  $\text{SiO}_2$  and  $\text{Al}_2\text{O}_3$ . The difference in wording Joret provides when teaching a mixed oxide compared to the portion of Joret cited by the Examiner to teach a mixture of Zn and Sn oxides (column 4 lines 32-35)

makes it quite clear that a mixed oxide is different from a mixture described in col. 4, i.e.,  
"one or more metal oxides chosen from ZnO, SnO<sub>2</sub>, ZrO<sub>2</sub>. "

In other words, if a mixed oxide such as claimed was intended by Joret, instead of phrasing one or more metal oxides as stated in col. 4, Joret would have disclosed directly "a mixed zinc tin oxide" as Joret does in column 5 lines 7-12 for the mixed silicon aluminium oxide.

Therefore, Joret does not disclose the mixed zinc tin oxide as defined in Claim 1.

Further, it cannot be concluded that the mixed oxide as defined in Claim 24 is met or suggested by Joret's suggestion to include a one or more of the oxides noted in the passage of col. 4.

During the aforementioned discussion, the Examiners questioned the identity of variables x, y and z in the formula presented in claim 24. Applicants note the present specification at the end of page 5:

*The inventors thus exploited the fact that, at an oblique incidence, the low reflection spectrum was broadened, and that it was thus possible to sanction the use of materials with an index of around 2, such as tin oxide SnO<sub>2</sub>, silicon nitride Si<sub>3</sub>N<sub>4</sub>, mixed tin-zinc oxides Sn<sub>x</sub>Zn<sub>y</sub>O<sub>z</sub>, mixed zinc-titanium oxides TiZnO<sub>x</sub> or silicon-titanium oxides Si<sub>x</sub>Ti<sub>y</sub>O<sub>z</sub>. By comparison with TiO<sub>2</sub> in particular, these materials, in addition to having better mechanical properties, have the advantage of having far higher deposition rates when use is made of the deposition technique known as cathode sputtering. In this modest range of indexes, there is also a wider choice of materials that can be deposited by cathode sputtering, thus offering greater flexibility in industrial manufacture and more options for adding additional functionalities to the multilayer as will be detailed hereinbelow.*

The specification on page 10 also describes:

*Another subject of the invention is the method for manufacturing glass substrates with an antireflection coating according to the invention. One method consists in depositing all the layers, in succession one after another, using a vacuum technique, particularly by magnetically-enhanced cathode sputtering or by corona discharge. Thus, the layers of oxide*

*can be deposited by reactive sputtering of the metal in question in the presence of oxygen, and the nitride layers can be deposited in the presence of nitrogen.*

Thus, the specification describes that all of the layers in the claimed substrate invention are to be made by the sputtering (magnetron) method. There is therefore a clear indication in the specification that the sputtering method is to be used for the deposit of the  $\text{Sn}_x\text{Zn}_y\text{O}_z$  layer.

Joret in column 5 lines 9-12 refers to the EP 791562 publication for an example of the mixed oxide. The corresponding U.S. patent is U.S. patent no. 5952084 (attached). In column 7 lines 27-30 (example 3) of US '084 experimental conditions to produce the mixed silicon aluminium oxide taught in Joret : a single target with an alloy of Si-Al is sputtered in an Oxygen and Fluorine atmosphere to obtain the mixed oxide (see also column 6 lines 60-62 for the gases). The process for the production of the mixed oxide of the  $\text{Sn}_x\text{Zn}_y\text{O}_z$  described in the present application is exactly the same : single targets made in alloys with various Sn and Zn contents are sputtered in oxygen atmosphere to produce the  $\text{Sn}_x\text{Zn}_y\text{O}_z$  films. In these films, the value of x, y and z depends on the initial (chosen) Sn/Zn ratio for the alloy constituting the target. This point is supported by the publication of Ohring which pertains the general knowledge of the skilled one in the field of sputtering techniques (attached; see also the publication of Hayashi et al, attached).

Therefore one skilled in the art who knows (A) how to sputter the mixed oxide of Sn and Zn to achieve the desired refractive index and thickness; and (B) that the variation in the number of x, y and z depends on the ratio of Sn/Zn in the initial target for sputtering would know what x, y and z are based on the values of refractive index and geometrical thickness as recited in the claims (specifically, see Claim 1).

An additional point raised during the aforementioned discussion was whether Joret's suggestion to mix two different oxides as in col. 4 of Joret would result in a mixed oxide as

defined in the claims. Joret is effectively silent on the specifics of how such a mixture would be effectuated. However, Joret does teach CVD deposition in column 8 lines 32-38, which is said to be preferable to deposit some of the layer of the stacks with a reference to WO97/43224 and which corresponds to US 6068914.

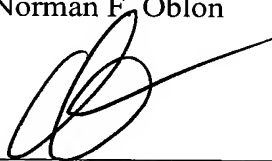
In column 4 lines 60-64 of US 6068914, it is clearly indicated that when a mixture of SnO<sub>2</sub> and ZnO is sought in a layer, a CVD (pyrolysis technique) is used. With CVD, a mixture of crystallized ZnO and SnO<sub>2</sub> is the result but not a mixed oxide. Therefore, one skilled in the art would know that Joret's teachings pertaining to the mixture of two or more oxides when made with the CVD technique would not result in a mixed oxide.

As Joret does not teach all of the claimed limitations nor suggest how to achieve the improved performance that has been discussed at length previously, the claims are neither anticipated by nor obvious in view of the cited Joret patent. Withdrawal of the rejection is requested.

A Notice of Allowance for all pending claims is kindly requested.

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